I. AMENDMENTS TO THE SPECIFICATION

Delete the paragraph beginning at page 2, line 2, and ending at page 2, line 10, and replace with the following:

B1

By ~~the~~ way of analogy, since a refrigerator has a flat and plain surface, generally, memos and recipes are stuck thereon by magnets or an adhesive tape, or a white board is magnetically fitted onto the surface so that schedules or other information can be written thereon by a marker. In such ways, however, the volume of information to be displayed is limited, and in ~~a~~ the case of using a white board, when the written information is erased, rubbish may be dispersed, and the writer may smudge a hand. Also, in these cases, what are written and displayed are only letters and schemes, and it is difficult to write accurate images.

Delete the paragraph beginning at page 2, line 1, and ending at page 2, line 25, and replace with the following:

B2

Japanese Patent Laid Open Publication Nos. 9-19768 and 8-35759 disclosed that a liquid crystal display is provided on the surface of a refrigerator. The displays suggested by these documents are of a type which uses liquid crystal without a memory effect and consumes electric power to keep displaying an image thereon. Refrigerators consume great electric power compared with other household electrical appliances, and to reduce the consumption of electric power of refrigerators is a big task in view of energy saving. Providing a liquid crystal display without a memory effect to a refrigerator results in an increase in the consumption of electric power of the refrigerator, which is against the demand of the times. Even if such a liquid crystal display without a memory effect is used, by using a timer to shut off supply of electric power to the display after a specified time, energy saving can be ~~achieved, in~~achieved. In this case, however, the image on the display will be erased simultaneously with the shut-off of supply of electric power.

Delete the paragraph beginning at page 3, line 3, and ending at page 3, line 6, and replace with the following:

B3

An object of the present invention is to provide a liquid crystal display device with a memory effect which ~~is to~~ achieves energy saving and ~~can keep displaying~~displays an image in good condition while not being supplied with electric power.

Delete the paragraph beginning at page 3, line 12, and ending at page 4, line 3, and replace with the following:

B4

The control circuit, for example, executes a rewriting process, at a specified time, to write on the display section in accordance with image data which correspond to the information currently displayed on the display section. The specified time means, for example, when a contact action with a screen of the display section is made. If a touch sensor is provided on the screen of the display section so that the user can command a specified control by touching a specified area of the touch sensor, this touching action may cause disorder of the image displayed on the display section. By executing the rewriting process, the image can be restored. The rewriting process may be executed repeatedly at uniform intervals of a predetermined time. For example, if no changes have been made on information displayed on the display section for a whole day, someone may touch the display section without intention during the time, and the image on the display section may be deformed. In this case, by executing the rewriting process automatically, the image can be restored. The rewriting process may ~~be also~~ also be executed after writing on part of the display section.

Delete the paragraph beginning at page 5, line 9, and ending at page 7, line 11, and replace with the following:

B5

~~This~~These and other objects and features of the present invention will be apparent from the following description with reference to the accompanying drawings, in which:

Fig. 1 is a front view of a refrigerator with a liquid crystal display device which is an embodiment of the present invention;

Fig. 2 is a perspective view of the refrigerator, showing a state where the liquid crystal display device is detached ~~therefrom.~~therefrom;

Fig. 3 is a perspective view of a modified liquid crystal display device;

Fig. 4 is a block diagram which shows a first exemplary power source/control circuit;

Fig. 5 is a block diagram which shows the power source/control circuit in more detail;

Fig. 6 is a block diagram which shows a second exemplary control circuit;

Fig. 7 is an illustration which shows a way of displaying the stock of food in the refrigerator;

B5 cont.

Fig. 8 is an illustration which shows a way of displaying a recipe;

Fig. 9 is an illustration which shows a way of displaying a message;

Fig. 10 is an illustration which shows a way of displaying a calendar;

Fig. 11 is a flowchart which shows a main routine for control of the liquid crystal display device;

Fig. 12 is a flowchart which shows a brightness detecting subroutine;

Fig. 13 is a flowchart which shows a timer interruption subroutine;

Figs. 14 and 15 are flowcharts which show an interruption subroutine;

Fig. 16 is a flowchart which shows a calendar displaying subroutine;

Fig. 17A is a flowchart which shows a data deleting subroutine executed in the calendar display process;

Fig. 17B is a flowchart which shows a new data writing subroutine executed in the calendar display process;

Fig. 18 is a flowchart which shows a picture displaying subroutine;

Fig. 19 is a flowchart which shows a message displaying subroutine;

Fig. 20 is a flowchart which shows a new data writing subroutine executed in the message display process;

Fig. 21 is a flowchart which shows a food stock displaying subroutine;

Fig. 22 is a flowchart which shows a recipe displaying subroutine;

Fig. 23 is a flowchart which shows a data reception displaying subroutine;

Fig. 24 is a sectional view of an exemplary liquid crystal display used as the display of the display device;

Fig. 25 is a plan view of the liquid crystal display, showing a state wherein a columnar structure and a sealant are formed on a substrate;

B5 cont'd.

Fig. 26 is an illustration which shows a manufacturing process of the liquid crystal display; and

Fig. 27 is a block diagram which shows a matrix driving circuit of the liquid crystal display.

Delete the paragraph beginning at page ~~10~~, line ~~8~~, and ending at page ~~11~~, line ~~5~~, and replace with the following:

As Fig. 6 shows, the CPU 40 has a ROM 45 which ~~is stored with~~ stores various programs and data and a non-volatile RAM 46 ~~to be stored with~~ that stores various kinds of data including data to be displayed. To the CPU 40, signals from the light sensor 12 and the rewrite switch 16 are inputted, and further, a signal from a data transmission device provided in the refrigerator body 1 and a signal from the bar code reader 17 are inputted via the data receiving section 13. Furthermore, a signal from a touch panel 140 provided on the liquid crystal display 100 is inputted to the CPU 40. The CPU 40 also has a calendar inside, and exchanges signals with a reading/recording device 47 which performs data reading/recording from and to a card inserted in the slot 14, an image processing unit 55 and an image memory 56. The image processing unit 55 performs necessary image processing to image data sent from the data receiving section 13 and the reading/recording device 47 and transmits the processed data to the image memory 56. Data inputted on the touch panel 140 are transmitted to the image memory 56 as image data. In accordance with the data stored in the image memory 56, the LCD controller 52 controls the driving IC 53 so as to apply voltages to scan electrodes and data electrodes of the liquid crystal display 100 in order, and thus, an image is written on the liquid crystal display 100. The image data stored in the image memory 56 are read out

B6

B6 cont.

via the image processing unit 55, are subjected to necessary image processing and are transmitted to the reading/recording device 47. Further, the CPU 40 controls the light 11 via an illumination controller 48.

Delete the paragraph beginning at page 11, line 6, and ending at page 11, line 19, and replace with the following:

B7

To the refrigerator body 1, a ~~whether~~ weather forecast, traffic information, event information, circular information, advertisements, e-mail reception, etc. are transmitted via a communication (telephone) line. Such information is inputted to the data receiving section 13 by use of an ~~IrDa~~ IrDA or the like to be displayed on the display device 10. Thus, the refrigerator can be used as an information sending base at home. The liquid crystal display device 10 is capable of keeping an image thereon without consuming electric power unless writing on the display 100 is required, and accordingly, the display device 10 does not increase the consumption of electric power of the refrigerator. On the other hand, whenever writing on the display 100 is required, the driving circuit of the liquid crystal display device 10 can be supplied with electric power immediately from the refrigerator body 1 connected to an outlet of electric power.

Delete the paragraph beginning at page 11, line 20, and ending at page 11, line 24, and replace with the following:

B8

In this embodiment, the power source/control circuit for the refrigerator body 1 and ~~that~~ for the liquid crystal display device 10 are separately structured. However, it is possible to incorporate the liquid crystal display device 10 in the refrigerator body 1 and to integrate ~~the~~ both circuits.

Delete the paragraph beginning at page 13, line 2, and ending at page 13, line 8, and replace with the following:

B9

Fig. 11 shows a main routine. When the battery 35 is fitted in the liquid crystal display device 10, or when the battery 35 is charged sufficiently, the CPU 40 starts~~,~~ and ~~first,~~ initializes the internal RAM, registers, timers, etc. at step S1. Then, a display 1 (calendar) is made at step S2, and the brightness is detected at step S3. Thereafter, the CPU 40 starts an energy saving timer at step S4 and comes to a sleep mode (energy saving mode) at step S5.

Delete the paragraph beginning at page 22~~,~~ line 13~~,~~ and ending at page 22, line 20, and replace with the following:

B10

Fig. 22 shows a recipe displaying subroutine (see ~~Fig. 8~~Fig. 8) executed at step S53. First at step S161, a recipe for menu 1 (curry) is displayed, and it is judged at step S162 whether or not any operation on the UP/DOWN keys 202 and 203 has been made. If either the key 202 or the key 203 has been operated, at step S163, another menu which is selected from the memory in accordance with the key operation is displayed. The energy saving timer is reset and started at step S164, and rewriting on the whole screen is performed at step S165.

Delete the paragraph beginning at page ~~22~~, line ~~21~~, and ending at page 22, line 25, and replace with the following:

B11

Next, it is judged at step S166 whether or not the display switch key 201 has been operated, and if not, the ~~programs~~ program goes back to step S162. If the key 201 has been operated, the energy saving timer is reset and started at step S167, and the display mode number is changed to 6 at step S168. Then, this subroutine is completed.

Delete the paragraph beginning at page 31, line 14, and ending at page 31, line 23, and replace with the following:

B12

On the side of the other substrate with the electrodes thereon, a sealant made of ultraviolet ray setting resin, thermosetting resin or the like is provided. The sealant is made into a ring along the periphery of the substrate. The sealant can be formed by a dispenser method or an ink jet method wherein resin is discharged from the end of ~~an~~ a nozzle onto the substrate, by a printing method wherein resin is printed on the substrates via a screen, a metal mask or the like, or by a transfer method wherein resin is supplied on a plate or a roller and thereafter transferred onto the substrate. Further, on at least one of the substrates, spacers are dispersed by a conventional method.

Delete the paragraph beginning at page 31, line 24, and ending at page 32, line 12, and replace with the following:

B13

These substrates are laminated with the respective electrode sides facing each other, and the laminate of substrates is heated while being pressed from both sides. The pressing/heating process can be performed, for example, in the way shown by Fig. 26. The substrate 112a with the resin columnar structure 115 formed thereon is placed on a flat plate 150, and the other substrate 112b is placed on the substrate 112a. At this time, the laminate of substrates is heated and pressed by a heating/pressing roller 151 from an end while passing between the roller 151 and the plate 150. By adopting this method, even if the substrates are flexible, for example, ~~are~~ film substrates, a cell can be fabricated accurately. If the columnar structure is made of thermoplastic polymer, the columnar structure is softened by heat and hardened by cool, whereby the substrates are bonded by the resin columnar structure. If the sealant is made of thermosetting resin, the sealant is hardened by the heat for the lamination of the substrates.